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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/606,024

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R. Victor Klassen

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EXAMINER

ROBINSON, MYLES D

ART UNIT

PAPER NUMBER

2625

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/606,024	Applicant(s) KLASSEN ET AL.	
	Examiner Myles D. Robinson	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/21/2009 has been entered.

Response to Amendment

2. Applicant's amendment was received on 1/21/2009, and has been entered and made of record. Currently, **claims 1 – 4** are pending.

Response to Arguments

3. Applicant's arguments (*see Remarks 1/21/2009*) with respect to the rejections of **claims 1 – 3** under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of **Matsunoshita** (U.S. Patent No. 5,835,691) and **Ohara** (U.S. Patent Application Publication No. 2003/0184800).

Regarding **claim 1**, the Applicant argues that **Christiansen et al.** (U.S. Patent Application Publication No. 2004/0114170) in view of **Kobayashi et al.** (U.S. Patent No. 6,101,576) does not disclose, teach or suggest where memory is used in a virtual disk

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transfer system (see *Remarks 1/21/2009 [page 5, line 20 – page 6, line 22 and page 8, lines 10 – 25]*).

However, Ohara does disclose a virtual disk transfer system (see *Figs. 6A – 6B wherein procedures of the virtual printing operations detect memory overflow of RAM 28 [Fig. 1] in steps S610 > S620 > S630 > S640 [paragraphs 0002, 0013, 0053 – 0054, 0062 and 0063]*).

Therefore, the Applicant's arguments regarding claims 1 – 3 are considered not persuasive. Please cite rationale of the grounds of rejection below for further explanation.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the paging out of chunks of data from the virtual disk transfer system in a most-recently used order such that a least-recently used chunk is read soonest (as recited in claim 4) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. ***Claims 1 – 3*** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Christiansen *et al.*** (U.S. Patent Application Publication No. 2004/0114170) in view of **Matsunoshita** (U.S. Patent No. 5,835,691) and further in view of **Ohara** (U.S. Patent Application Publication No. 2003/0184800).

Referring to **claim 1**, Christiansen discloses a method of operating a printing system for parallel processing a print job (*see Fig. 1 wherein raster image processing (RIP) system 100 processes print job 103 in parallel [paragraphs 0020 – 0021 and 0035]*) with a plurality of processing nodes into a printer ready format for printing the print job (*see Figs. 1 and 2 wherein RIP engines 109 rip print job 103 into a printer ready format for RIPped output file 123 for output to print device 126 [paragraphs 0021*

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– 0022 and 0025 – 0026]), said processing nodes communicating with a disk transfer system (see Fig. 2, memory 146 [paragraphs 0034 and 0091]), comprising:

splitting the print job into a plurality of job chunks (see Fig. 2, partition manager 176 and see Fig. 14, steps 519 – 523 [paragraphs 0064 – 0065]), wherein the chunks are selectively sized from at least one page to an entire size of the print job (paragraphs 0021 and 0023 wherein the partitions of print job 103 are analogous to the plurality of job chunks of the print job) in accordance with predetermined factors for enhancing page processing efficiency (see Fig. 9 wherein a user provides pipeline acceptance criteria 299 for a respective pipeline 113 such that the criteria 299 is analogous to predetermined factors [paragraphs 0041 – 0042] and see Figs. 15A - 15B wherein the system determines partitions of the print job based upon criteria 299 [i.e. predetermined factors] [paragraphs 0067 – 0071]),

selectively storing the job chunks and print-ready pages in the disk transfer system wherein the transfer system data comprises an intermediary storage for data transfer to selected processing nodes (see Figs. 1, 2 and 14 wherein partitions are queued up within memory 146 to wait until at least one RIP engine 109 to which the partition is assigned becomes available in step 506 [paragraphs 0022 and 0063]) including a RAM and physical disk (see Fig. 2 wherein memory 146 comprises RAM and physical disks [e.g. hard disk drives, floppy drives, compact discs, magnetic tape drives, etc.] [paragraphs 0034 and 0091]),

assigning the job chunks to respective processing nodes for processing the job chunks into the printer-ready format (see Figs. 2 and 14 wherein print job preprocessor

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173 determines which pipeline 133, which comprises RIP engines 109, to which the print job 103 is to be applied in step 519 and then transfers the print job to partition manager 176 [paragraph 0064] and see Figs. 2 and 15B wherein then partition manager 176 applies partition to the pipeline 113 for RIPping in step 633 [paragraph 0073], and printing the print job (see Figs. 1 and 16 wherein the RIPped output file 123 is then applied to a print device 126 for printing in box 716 [paragraphs 0026 and 0083])

but does not explicitly disclose the method further wherein the memory is a virtual disk transfer system, comprising monitoring available space in the virtual disk transfer system including detecting a data overflow in the RAM and storing new data in the physical disk until data storage in the RAM is available.

Matsunoshita discloses the method wherein the memory is a disk transfer system, comprising monitoring available space in the virtual disk transfer system including detecting a data overflow in the RAM (see Fig. 2 wherein overflow/underflow (OF/UF) detection section 208 detects overflow of code buffer 204[i.e. RAM] [column 11, lines 53 – 54, 59 – 62 and column 12, lines 32 – 36]) and storing new data in the physical disk until data storage in the RAM is available (see Fig. 2 wherein OF/UF detection section 208 regulates data transfer [i.e. read/write operation] between the code buffer 204 [i.e. RAM] and the hard disk 205 based upon data rate transfers as well as available space within code buffer 204 [Abstract, column 12, lines 15 – 36, 56 – 59, column 13, lines 6 – 19 and column 13, line 35 – column 14, line 5]) but does not explicitly disclose the method wherein the disk transfer system is virtual.

Ohara discloses the method wherein the disk transfer system is virtual (*see Figs. 6A – 6B wherein procedures of the virtual printing operations detect memory overflow of RAM 28 [Fig. 1] in steps S610 > S620 > S630 > S640 [paragraphs 0002, 0013, 0053 – 0054, 0062 and 0063]*).

Christiansen, Matsunoshita and Ohara are combinable because they are from the same field of endeavor, being print management systems for large documents. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include monitoring the available space within the printer RAM while reading print data to the hard drive. The suggestion/motivation for doing so would have been to resolve any missing data that may result due to slow transfer rates and overflow while maintaining high image quality, as suggested by Matsunoshita (*column 1, lines 57 – 63, column 2, lines 3 – 7, column 4, line 58 – column 5, line 4 and column 14, lines 36 – 58*).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include virtual printing operations to detect memory overflow. The suggestion/motivation for doing so would have been to obviate the waste of print resources, such as toner, ink and paper, due to memory overflow errors in advance of the actual printing of large documents, as suggested by Ohara (*paragraphs 0013 – 0014, 0062 – 0064 and 0069 – 0070*).

Referring to **claim 2**, Ohara discloses the method further comprising the step of preventing selected chunks from being added to the virtual disk transfer system when the monitored available space falls below a predetermined threshold representative of the overflow (*see Figs. 6A – 7B wherein the virtual printing operations of Figs. 6A – 6B*

will prevent the actual execution of printing operations of Figs. 2A – 2B in the printer with the memory full error so that that large print job may be forwarded to another more capable printer [paragraphs 0013 – 0014, 0062 – 0065 and 0069 – 0072]).

Referring to **claim 3**, Christiansen discloses the method further wherein the splitting step is preformed by a splitter (see Figs. 2 and 15A – 15B, partition manager 176 [paragraphs 0064 – 0065]) and further comprising the step of withholding chunk destinations from the splitter (see Figs. 2 and 16 wherein RIP handler 179 receives the partitioned print job [i.e. plurality of job chunks] and assigns those partitions to RIP engines 209 for processing in such a manner that RIP handler 179, which determines the chunk destinations [i.e. pipeline 113 comprising RIP engines 109], functions properly without revealing to partition manager 176, which splits the print job into chunks, which one(s) of RIP engines 109 the partitions will be assigned [i.e. withholding chunk destinations from the splitter] [paragraphs 0074 – 0083]).

7. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Christiansen et al.** (U.S. Patent Application Publication No. 2004/0114170 in view of **Matsunoshita** (U.S. Patent No. 5,835,691) in view of **Ohara** (U.S. Patent Application Publication No. 2003/0184800) and further in view of **Dimperio et al.** (U.S. Patent No. 5,142,667).

Referring to **claim 4**, Christiansen, Matsunoshita and Ohara disclose the method as discussed above in claim 4 but does not explicitly disclose the method further

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including paging out the print data from the disk transfer system in a most-recently used order, wherein a least recently-used chunk is read soonest.

Dimperio discloses the method including paging out the print data from the disk transfer system in a most-recently used order, wherein a least recently-used chunk is read soonest (*see Figs. 20 – 21 and 26 wherein most recent printing is best for deleting some image file(s, which may be pages or segments [e.g. parts of pages], from memory in order to make room for the next image file to be brought into memory [column 13, lines 19 – 33, 52 – 68, column 16, lines 30 – 40, 53 – 58, column 17, lines 3 – 30, column 18, lines 65 – 68 and column 22, lines 7 – 35]*).

Matsunoshita, Ohara and Dimperio are combinable because they are from the same field of endeavor, being memory management systems. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include printing in most recently used order when a job is printing and memory reaches capacity. The suggestion/motivation for doing so would have been to improve memory and/or disk performance by generating the least amount of swapped segments while reducing the amount of disk reading to a minimum, as suggested by Dimperio (*column 13, lines 52 – 68, column 17, lines 20 – 28 and column 22, lines 17 – 35*).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barry et al. (U.S. Patent No. 5,859,711) discloses multiple print engines with virtual job routing (*see Abstract and Figs. 1, 2, 12 and 13*).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Myles D. Robinson whose telephone number is (571)272-5944. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler L. Haskins can be reached on (571) 272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Myles D. Robinson/
Examiner, Art Unit 2625

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/Twyler L. Haskins/

Supervisory Patent Examiner, Art Unit 2625